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10/070,633	03/04/2002	Joanne Elizabeth Anderson	PU3703USW	9460

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DAVID J LEVY, CORPORATE INTELLECTUAL PROPERTY
GLAXOSMITHKLINE
FIVE MOORE DR., PO BOX 13398
RESEARCH TRIANGLE PARK, NC 27709-3398

EXAMINER

SHIBUYA, MARK LANCE

ART UNIT

PAPER NUMBER

1639

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/070,633

Applicant(s)

ANDERSON ET AL.

Examiner

Mark L. Shibuya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 14-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/4/02</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. Claims 1-39 are pending. Claims 14-39 are withdrawn. Claims 1-13 are examined.

Election/Restrictions

2. Applicant's election without traverse of Group I, claims 1-13 in the reply filed on 9/9/04, is acknowledged.

3. Claims 14-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention, there being no allowable generic or linking claim.

Priority

4. The instant application is a 371 of PCT/US00/28218, filed 10/12/2000, which claims benefit of 60/159,673, filed 1/15/1999.

Information Disclosure Statement

5. It is noted that the inventors listed for US 5,313,264 A and US 5,565,324 A, as cited on the IDS filed 3/4/2002, appear to be incorrect.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-5, 9-11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Yan et al., J. Org. Chem. (Oct. 18, 1996) Vol. 61, pp. 7467-7472.

The claims are drawn to a method for monitoring a solid phase chemical reaction, said method comprising the steps of: providing a reaction mixture comprising a solid support and a liquid reaction medium, contacting an attenuated total reflection element to said reaction mixture; and then directly monitoring said chemical reaction on said solid support through said attenuated total reflection element; and wherein said monitoring step is carried out by attenuated total reflection spectroscopy.

Yan et al., J. Org. Chem. (Oct. 18, 1996) Vol. 61, pp. 7467-7472, throughout the publication and especially at p. 7469, para 2-p. 7461, para 2, Figures 4-6, Scheme 4, p. 7471, para 1-p. 7472, para 2 and 7, teach the attenuated total reflection (ATR) infrared, microscopic, (using a germanium objective), continuous monitoring of the reaction kinetics of esterification on the solid surface and interior of a single polystyrene bead; wherein the absorbance of the 1723 cm^{-1} band increases with introduction of the ester

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carbonyl and absorbance of the 3445 cm^{-1} band decreases with the disappearance of the hydroxyl group.

7. Claims 1-5, 9-11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Yan et al., J. Comb. Chem. (1999) Vol. 1, pp. 46-54, (published on Web 12/01/1998).

The claims are drawn to a method for monitoring a solid phase chemical reaction, said method comprising the steps of: providing a reaction mixture comprising a solid support and a liquid reaction medium, contacting an attenuated total reflection element to said reaction mixture; and then directly monitoring said chemical reaction on said solid support through said attenuated total reflection element; and wherein said monitoring step is carried out by attenuated total reflection spectroscopy.

Yan et al., throughout the publication and especially at the abstract, p. 47, para 7, p. 48, para 7-p. 49, para 1, Scheme 1 and Figure 1, teach a Attenuated Total Reflection (Macro-ATR) method measuring infrared transmission to monitor solid-phase organic reactions (see Scheme 1) on polystyrene or polystyrene-poly(ethylene glycol) based resin beads.

8. Claims 1-4, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheng et al., Langmuir (1998) Vol. 14, pp. 839-844, (published on Web 01/23/1998).

The claims are drawn to a method for monitoring a solid phase chemical reaction, said method comprising the steps of: providing a reaction mixture comprising a

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solid support and a liquid reaction medium, contacting an attenuated total reflection element to said reaction mixture; and then directly monitoring said chemical reaction on said solid support through said attenuated total reflection element; and wherein said monitoring step is carried out by attenuated total reflection spectroscopy.

Cheng et al., throughout the publication, and especially at the abstract, p. 840, para 2-7, Figure 1, p. 841, para 3, figure 3, p. 843, para 3, teach attenuated total reflection Fourier transform infrared (ATR-FTIR) to monitor the tethering of phospholipid bilayers to gold-coated, ZnSe crystals (which reads on a solid support bound to the attenuated total reflection element, as in claim 12).

9. Claims 1-5, 9-11, 13 are rejected under 35 U.S.C. 102(a) as being anticipated by Huber et al., *Analytica Chimica Acta*, vol. 393, (28 July 1999), pp. 213-221.

The claims are drawn to a method for monitoring a solid phase chemical reaction, said method comprising the steps of: providing a reaction mixture comprising a solid support and a liquid reaction medium, contacting an attenuated total reflection element to said reaction mixture; and then directly monitoring said chemical reaction on said solid support through said attenuated total reflection element; and wherein said monitoring step is carried out by attenuated total reflection spectroscopy.

Huber et al., throughout the publication and especially at the abstract, p. 214, para 1, p. 215, para 1-p. 217, para 1, Scheme 1, Figures 1-5, Table 1, p. 217, para 3, p. 219, para 2-p. 220, para 2, teach the use of attenuated total reflection (ATR) Fourier transform infrared (FT-IR) micro-spectroscopy for structure confirmation of compounds

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synthesized in the course of a six step reaction sequence (Scheme 1) on small polystyrene polymer beads for use in combinatorial chemistry.

10. Claims 1, 2, and 9-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Eipel et al., (US 6,737,024).

The claims are drawn to a method for monitoring a solid phase chemical reaction, said method comprising the steps of: providing a reaction mixture comprising a solid support and a liquid reaction medium, contacting an attenuated total reflection element to said reaction mixture; and then directly monitoring said chemical reaction on said solid support through said attenuated total reflection element; and wherein said monitoring step is carried out by attenuated total reflection spectroscopy.

Eipel et al., (US 6,737,024), effective date Jan. 14, 1999, at col. 1, lines 47-56, col. 2, lines 28-67, Fig. 2, col. 3, lines 46-55 and 65, col. 4, lines 1-16, 37-59, col. 5, lines 5-10 and 31-37, teach methods of combinatorial chemistry using automated solid-phase synthesis, including separate discrete solid supports, where the support may be glass, quartz, silicon, germanium, or polystyrene, and wherein attenuated total reflection is used to measure light absorption.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of **Yan et al.**, J. Org. Chem. (Oct. 18, 1996) Vol. 61, pp. 7467-7472; **Yan et al.**, J. Comb. Chem. (1999) Vol. 1, pp. 46-54, (published on Web 12/01/1998); **Cheng et al.**, Langmuir (1998) Vol. 14, pp. 839-844, (published on Web 01/23/1998); **Huber et al.**, Analytica Chimica Acta, vol. 393, (28 July 1999), pp. 213-221; or **Eipel et al.**, (US 6,737,024), each taken separately, and in view of **Zuellig et al.**, (US 6,126,904).

The claims are drawn to a method for monitoring a solid phase chemical reaction, said method comprising the steps of: providing a reaction mixture comprising a solid support and a liquid reaction medium, contacting an attenuated total reflection element to said reaction mixture; and then directly monitoring said chemical reaction on said solid support through said attenuated total reflection element; wherein said monitoring step is carried out by attenuated total reflection spectroscopy; and wherein the reaction is a Mitsunobu reaction, a Freidel-Craft reaction or Suzuki reaction.

Yan et al., J. Org. Chem. (Oct. 18, 1996) Vol. 61, pp. 7467-7472, throughout the publication and especially at p. 7469, para 2-p. 7461, para 2, Figures 4-6, Scheme 4, p. 7471, para 1-p. 7472, para 2 and 7, teach the attenuated total reflection (ATR) infrared,

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microscopic, (using a germanium objective), continuous monitoring of the reaction kinetics of esterification on the solid surface and interior of a single polystyrene bead; wherein the absorbance of the 1723 cm^{-1} band increases with introduction of the ester carbonyl and absorbance of the 3445 cm^{-1} band decreases with the disappearance of the hydroxyl group.

Yan et al., J. Comb. Chem. (1999) Vol. 1, pp. 46-54, (published on Web 12/01/1998) throughout the publication and especially at the abstract, p. 47, para 7, p. 48, para 7-p. 49, para 1, Scheme 1 and Figure 1, teach a Attenuated Total Reflection (Macro-ATR) method measuring infrared transmission to monitor solid-phase organic reactions (see Scheme 1) on polystyrene or polystyrene-poly(ethylene glycol) based resin beads.

Cheng et al., throughout the publication, and especially at the abstract, p. 840, para 2-7, Figure 1, p. 841, para 3, figure 3, p. 843, para 3, teach attenuated total reflection Fourier transform infrared (ATR-FTIR) to monitor the tethering of phospholipid bilayers to gold-coated, ZnSe crystals (which reads on a solid support bound to the attenuated total reflection element, as in claim 12).

Huber et al., throughout the publication and especially at the abstract, p. 214, para 1, p. 215, para 1-p. 217, para 1, Scheme 1, Figures 1-5, Table 1, p. 217, para 3, p. 219, para 2-p. 220, para 2, teach the use of attenuated total reflection (ATR) Fourier transform infrared (FT-IR) micro-spectroscopy for structure confirmation of compounds synthesized in the course of a six step reaction sequence (Scheme 1) on small polystyrene polymer beads for use in combinatorial chemistry.

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Eipel et al., (US 6,737,024), effective date Jan. 14, 1999, at col. 1, lines 47-56, col. 2, lines 28-67, Fig. 2, col. 3, lines 46-55 and 65, col. 4, lines 1-16, 37-59, col. 5, lines 5-10 and 31-37, teach methods of combinatorial chemistry using automated solid-phase synthesis, including separate discrete solid supports, where the support may be glass, quartz, silicon, germanium, or polystyrene, wherein the automated systems include metering devices for dispensing liquid, and wherein attenuated total reflection is used to measure light absorption.

None of Yan et al., J. Org. Chem. (Oct. 18, 1996) Vol. 61, pp. 7467-7472; Yan et al., J. Comb. Chem. (1999) Vol. 1, pp. 46-54, (published on Web 12/01/1998); Cheng et al.; Huber et al.; or Eipel et al., (US 6,737,024), teach methods for monitoring a solid phase chemical reaction by attenuated total reflection spectroscopy, wherein the reaction is a Mitsunobu reaction, a Freidel-Craft reaction or a Suzuki reaction.

Zuellig et al., (US 6,126,904), effective filing date of March 7, 1997, at col. 4 line 54-col. 6, line 26, teach synthesis of combinatorial chemical libraries, particularly by employment of solid phase chemistry (col. 5, lines 16-32) and teach that the Suzuki coupling, Mitsunobu reaction, and Friedel-Crafts reaction (as in claims 6-8) are synthetic reactions which may be conducted in solution or on solid phase supports, and are useful in the synthesis of combinatorial chemical libraries.

It would have been *prima facie* obvious at the time the invention was made, for one of ordinary skill in the art to use methods for monitoring a solid phase chemical reaction by attenuated total reflection spectroscopy, wherein the reaction is a Mitsunobu reaction, a Freidel-Craft reaction or a Suzuki reaction.

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One of ordinary skill in the art would be motivated to monitor a Mitsunobu reaction, a Freidel-Craft reaction or Suzuki reaction by attenuated total reflection spectroscopy because Huber et al. and Eipel et al. teach monitoring of combinatorial chemistry on solid supports using attenuated total reflection and Zuellig et al., teach Suzuki coupling, Mitsunobu reaction, and Friedel-Crafts reaction (as in claims 6-8) are synthetic reactions, which may be conducted in solution or on solid phase supports, and are useful in the synthesis of combinatorial chemical libraries.

Conclusion

12. Claims 1-13 are rejected.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shibuya whose telephone number is (571) 272-0806. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark L. Shibuya
Examiner
Art Unit 1639

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PADMASHRI PONNALURI
PRIMARY EXAMINER